REMARKS

Entry of the foregoing and favorable reconsideration and reexamination of the subject application, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, and in the light of the remarks which follow is respectfully requested.

By the present amendment, claim 24 has been amended in response to the Examiner's note that claim 24 is suggesting that "a scientific comparison could be effectively conducted under varying control conditions" and that "similar conditions" are less than adequate in laboratory testing. The amendment substituting "similar conditions" for "the same conditions" should address this note. Claim 24 has been further amended to recite a method for assessing in vitro the agronomical fitness of a plant as measured by its seed yield. Support for this amendment can be found in the specification at least on page 16, lines 15 to 17. Applicant submits that no new matter has been added via this amendment.

Claims 24 to 37 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Dodds et al in view of Strack et al., Muller et al., Moldau, Uotila et al., Chen et al., or Masojidek et al. (as cited in the previous Office Action,

and further in view of Smith et al. In as far as the rejection still applies to the amended claims, it is respectfully traversed.

In rendering this rejection, the Examiner thus purports that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the method of Dodds et al, modifying same by obvious parameter optimizations known in the art, to assess the agronomical fitness of plants by experimentally determining their ability to resist damage from stresses known in the art, as compared to a control, given the known correlation between respiration and plant growth rate as described by Smith et al.

As explained in the response to the previous Official Action, Dodds et al. describe a method for determination of cell viability in suspension cultures by measuring the cells' capacity to reduce 2, 3, 5-triphenyltetrazolium chloride to measure the electron flow in the mitochondrial electron transport chain. Dodds et al. report a "close positive correlation between the amount of formazan (the reduced reaction product) produced and the percentage of viable cells in the sample". Thus, Dodge et al. teach a correlation between mitochondrial electron transport and the viable fraction of the cells in a cell suspension culture.

Each of the secondary references by Strack et al., Muller et al., Moldau, Uotila et al., Chen et al, or Masojidek et al, describes subjecting plants to a specific stress and analyzing at different levels the affected physiological and biochemical processes. None of these references analyze the effect of the particular imposed stress on mitochondrial electron flow. Only Masojidek et al. describe analyzing photosynthetic electron transport.

None of these references disclose a positive correlation between mitochondrial electron flow in stressed isolated explants or plant material, and

fitness or agronomical performance of the complete plants, the latter normally being determined by field trials.

In an attempt to remedy this deficiency, the Examiner has cited Smith et al. and characterized it as teaching that dark respiration rate is strongly correlated with plant growth rate.

However, the current claims are directed to measuring mitochondrial electron flow in stressed isolated explants. The positive correlation between dark respiration and agronomical performance has been reported by Smith et al. for unstressed seedlings. Smith et al. remain completely silent on how the dark respiration (or mitochondrial electron flow) would evolve when the explants have been subjected to a stress condition prior to determining dark respiration or mitochondrial electron flow. Indeed, prior to the current application, it could not be predicted whether respiration under stress conditions would increase or decrease, let alone to ***predict that the plants with the highest mitochondrial electron flow under stress conditions would be the agronomically fittest plants***.

Moreover, the correlation disclosed by Smith et al. is between dark respiration and plant growth. Plant growth, however, is not a good parameter to describe agronomical performance of a plant. To describe more clearly the invention, Applicant has amended the claims to recite a method for assessing ***in vitro*** the agronomical fitness of a plant **as measured by its seed yield** (see specification at least page 16, lines 30 to 31). Smith et al. do not provide a positive correlation between dark respiration rate and **seed yield** (nor between plant growth and seed yield).

In other words, the combination of primary and secondary cited prior art references, did not allow the person skilled in the art to predict that the larger the mitochondrial electron flow under stress conditions, when compared to the

measurement of mitochondrial electron flow in a control plant under the same stress conditions, the fitter the plant would be, as expressed by its seed yield.

Applicant also maintains that there is no motivation to combine the teaching of these references, i.e., to measure mitochondrial electron flow in the cells of an explant or plant material after applying stress in order to assess agronomical performance of the plants.

To provide the motivation to combine all these references, the Examiner has pointed to "the expectation that the resistance to stress factors *in vitro* would correlate with resistance in the field." Irrespective of whether such expectation indeed existed, the Examiner has provided no evidence that it included the expectation that resistance to stress factors equals positive correlation between mitochondrial electron flow under stress and seed yield of the assessed plant variety. In view of this fact the combined references neither provide motivation nor any reasonable expectation of success.

Thus, the Examiner's rejection of the claimed invention as obvious over Dodds et al. in view of Strack et al., Muller et al., Moldau, Uotila et al., Chen et al, or Masojidek et al., and further in view of Smith et al., must be based on hindsight.

> *"Hindsight .....is quite improper when resolving the question of obviousness. To use the patent in suit as guide through the morass of prior art references, combing the right references in the right way to arrive at the result of the claims in suit is ..... also quite improper."* (*Medtronic Inc. v. Daig Corp.*, 611 F. Supp. 1498, 1534, 227 USPQ 509, 535 (D. Minn., 1985), *aff'd* 789 F. 2d 903, 229 USPQ 664 (Fed. Cir. 1986) *cert. denied,* 479 U.S. 931 (1986)).

Thus, in view of the above argument, withdrawal of the rejection is respectfully requested.

From the foregoing, reasonable action in the form of a Notice of Allowance is respectfully requested and earnestly solicited.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a three (3) month extension of time for filing a reply in connection with the present application, and the required fee of $920.00 is attached hereto.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the under signed at the telephone number listed below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By _____
Gerald M. Murphy, Jr., #28,977

MaryAnne Armstrong, PhD., #40,069

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

GMM/MAA/csm
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Attachment: Version with Markings to Show Changes Made

(Rev. 02/20/02)

Marked-Up Version of Claims

24. (Twice Amended) A method for assessing *in vitro* the agronomical fitness of a plant as measured by its seed yield, comprising the steps of:

a.) subjecting an explant of said plant to a stress condition;

b.) measuring the electron flow in the mitochondrial electron transport chain to assess agronomical fitness in cells of said explant of said plant;

c.) comparing said measurement to that of explants of control plants or control plant material, under [similar] the same conditions as for said explants of said plant, wherein the greater the amount of electron flow the fitter said plant.